Sudbury-Riley, Lynn, Philippa Hunter-Jones, Ahmed Al-Abdin, Daniel Lewin and Mohabir Vic Naraine (2020).

Journal of Service Research. This is the accepted manuscript before publisher style settings.

The Trajectory Touchpoint Technique: A Deep Dive Methodology for Service Innovation

ABSTRACT

This paper introduces the Trajectory Touchpoint Technique (TTT), a service design methodology that harnesses customer experiences for enriched understanding of value throughout multilevel service components to ultimately increase innovativeness. We detail the design and development of the TTT using Design Science Research (DSR), a goal-oriented methodology that produces robust and practical solutions to organizational problems. We demonstrate the TTT's practical utility through collaborations with different organizations (n = 9) and diverse service users (n = 240). We show how the TTT is an easy to use methodology that enhances understanding of value creation, and illustrate its benefits with concrete examples of innovations to service encounters, the service system, and the value constellation. We reveal how a service design methodology can be the bridge between the theoretical standpoint of S-D logic's perspective on value cocreation and the practical tools and techniques required to operationalize it.

Key Words: Service Design, Design Science Research, Service Innovation, S-D Logic, Service experience.

The meaning of service innovation is changing. Early innovation classifications, such as radical versus incremental, had much in common with the goods dominant logic perspective which conceptualized innovation as new products or product improvements. In contrast, a new way of viewing service innovation is emerging. Based on S-D logic (Vargo and Lusch 2004, 2017), this new perspective shifts focus from output to customer value (Skålén et al. 2015; Vargo and Lusch 2008). The lens of S-D logic reveals service innovation as a more evolutionary process of creating, combining, and reconfiguring resources to transform the ways service is designed, developed, delivered, and perceived (Foglieni, Villari and Maffei 2018). Consequently, viewing service innovation as change to perceived value broadens its meaning to incorporate small improvements to single service activities as well as completely new service offerings (Witell et al. 2016). Changing focus from organizational output to value experienced by the beneficiary means that customer participation in the innovation process is mandatory (Edvardsson et al. 2010; Lusch and Nambisan 2015). However, while research stresses the centrality of a deep understanding of customers to innovation processes and practices (Storey and Larbig 2018), embedding and managing customer involvement is complex, and research offers little guidance on how an organization can actually achieve this (Ngo and O'Cass 2013). We fill this gap with the Trajectory Touchpoint Technique (TTT), a deep dive methodology that harnesses customer experiences for enriched understanding of value throughout multilevel service components to ultimately increase innovativeness. The purpose of this paper is to introduce the TTT, explain its development, and examine its utility.

Service systems are complex constellations of integrated resources connected to others at micro, meso, and macro levels (Maglio and Spohrer 2008), and range from individuals and enterprises to national and global systems. Small changes in customer tastes to dynamic and turbulent trends such as the digital revolution and population aging impact these service systems in different ways. At the same time, a service is multilayered and hierarchical, comprising the service encounter (the interface where the customer and service provider interact), the organizational level service system (service architecture and process), and the value proposition (the strategic level service concept) (Patrício et al. 2011). Innovation within some or all of these levels enables the organization to identify and adapt to emerging developments (Foglieni et al. 2018). A value creation emphasis on service innovation means analyses need to consider interdependencies between service systems as well as within and between levels of the service hierarchy (Patrício, Gustafsson, and Fisk 2017). Service innovations can also comprise new roles for customers and new ways of acting (Wetter-Edman, Vink, and Blomkvist 2017).

Embedded within S-D logic's pivotal concept of value cocreation are two key perspectives useful for examining service innovation. First, focusing on resource integration within and between different levels of

service can uncover possibilities for new value cocreation and therefore innovation opportunities (Overkamp et al. 2018). Second, S-D logic contends that the beneficiary uniquely and phenomenologically determines value (Vargo and Lusch 2017) and provides an overall theoretical framework which views value cocreation as "resource-integrating, reciprocal-service providing actors cocreating value… through their institutional arrangements" (Vargo and Lusch 2016, p. 7). S-D logic is useful for enriching understanding of value cocreation and facilitation through resource integration at a theoretical level. Additionally, S-D logic has challenged traditional ways of thinking about outputs, shifting the focus of innovation and service effectiveness by spotlighting value-in-use and context, and always from the perspective of the customer (Fuentes and Smyth 2016). However, it lacks practical processes and techniques to guide organizations in how they should gather the unique and phenomenological insights into value cocreation from the customer's perspective, and the ways to configure resources to enhance potential value cocreation opportunities (Payne, Storbacka, and Frow 2008).

Recently, advocates of service design suggest this is the way to bridge the gap between the theoretical standpoint of S-D logic's perspective on value cocreation and the practical tools and techniques required to operationalize it (Wetter-Edman et al., 2014). Service design systematically examines services through the designer's lens, employing design methods and techniques in order to visualize, observe, and interpret needs and behaviors and transform them into possible service futures (Teixeira, Patrício and Tuunanen 2018). Possible service futures incorporate both the design of new services and incremental improvements to current service systems (Zomerdijk and Voss 2010), making service design paramount to service innovation (Storey and Larbig 2018). Service design provides the tools and techniques needed for addressing a specific need using people-centered, creative, systematic, and collaborative processes (Foglieni et al. 2018). It has emerged as a distinct field of recognition, not least because it takes an interdisciplinary and holistic perspective of the service system (Patrício et al. 2011) in order to cope with the complex and multifaceted dimensions of modern services. There are clear opportunities for synergy by blending service design and S-D logic (Kimbell 2011; Meroni and Sangiorgi 2011; Wetter-Edman et al. 2014). Such synergies respond to recent calls for more innovation research into cocreation which argue that current theoretical insights and practical applications are too remote (Dresch, Lacerda, and Antunes 2015). In response, we introduce the TTT. The TTT is an *enabling* methodology (Frow et al. 2015) in that it provides the practical knowledge and insights needed to apply key theoretical principles of S-D logic to service systems in order to innovate through enhanced cocreation opportunities.

We demonstrate the evolution and utility of the TTT in a field rarely examined in service research: palliative care, as well as its adaptation and use in alternative service ecosystems. We establish how the TTT

empirically and systematically collects the unique phenomenological insights needed to determine value from the customer's perspective, and at different service levels, which is important given the intricacies of these experiences and the methodological challenges of obtaining such data (Jüttner et al. 2013). But the TTT is more than a data collection tool. In order for it to be useful, effective knowledge transfer needs to follow knowledge acquisition (Storey and Larbig 2018). Consequently, the TTT has a built-in knowledge transfer system. We explain and demonstrate how the TTT harnesses rich customer insights into practical ways in which the organization can coordinate value cocreation by reconfiguring actors and other resources within and across different levels of the service system to ultimately increase innovativeness. We show its effectiveness with organizations that had already utilized a range of qualitative and quantitative methodologies to collect customer experience data, thereby demonstrating the TTT's superiority at uncovering value creation opportunities that other methodologies had failed to expose. We will illustrate how this new methodology has enabled organizations to view their service as value offerings, and demonstrate empirically how the TTT leads to innovations and enhanced value cocreation at the levels of the service encounter, the organizational service system level, and indeed to the strategic level with enhanced value cocreation within a wider ecosystem. Just as S-D logic incorporates theoretical perspectives on user experience and service systems (Overkamp et al. 2018), the TTT provides a practical way of capturing customer experiences and using them to reconfigure resources at different levels of service in order to enhance value cocreation. The TTT is likely to be useful to any organization that wishes to incorporate the principles of value cocreation into service design, but is currently struggling with the practicalities of doing so.

We next provide an overview of service design methods that focus on customer experience. Several of these methods informed or inspired the creation of the TTT, and we justify this in the next section. We then explain design science research (DSR), a creative and goal-oriented problem-solving paradigm (Hevner et al. 2004) that is still novel to both service design and service research (Teixeira et al. 2018) before structuring the remaining sections of this paper around the 6-stage DSR process advocated by Peffers et al. (2007) which we used in order to develop the TTT. The paper closes with a consideration of our contributions.

Service Design Methods

A review of the service design literature reveals a variety of resources that describe, classify, and critique a large array of service design methods. Resources range from websites (e.g., servicedesigntools.org) and toolkits (e.g., Service Design Toolkit 2012), to book chapters (e.g., Kimbell and Blomberg 2017) and journal papers (e.g., Patrício, Fisk, and Cunha 2008; Teixeira et al. 2017). We rejected large numbers of these

methods relatively quickly. First, we rejected some of the less-known service design methods because they have little or no robust evaluation testifying to their effectiveness. We rejected a second group, though rigorously evaluated with undoubted contributions to the service design literature, on the basis that they focused solely on technology based service design. Our attention was on designing a methodology appropriate for use with any type of service from technology based to those classified as human services. Third, we found many methods originate from a goods-dominant logic, or value-in-exchange, perspective. Examples from this group include queueing, scheduling, and optimization frameworks that examine the arrangement or movement of resources within a service system (Glushko 2013). These methods tend to take an inside-out approach to service design, viewing service systems from the standpoint of the provider or the designer and are therefore outdated from a contemporary S-D logic perspective that embraces the concept of value-in-use (Vargo and Akaka 2009).

In recent years a wide range of novel methods that do involve the customer in service design have emerged. At their heart is a focus on user orientation and contextualization and therefore they do take a cocreation perspective. These methods incorporate the concept of design thinking, which transcends customer participation in the form of surveys or semi-structured qualitative interviews to ensure deeper understanding of customer experiences of multidimensional, complex services, often using physical enactments (e.g., 'body-storming' or role playing), and context mapping using 'make-tools' (drawing and creating physical models with a variety of materials) which can elicit latent needs or feelings (Holmlid 2009). However, we wanted to design a methodology that is *enabling* and *inclusive* for all users. Inappropriate design excludes the elderly, the disabled, and the marginalized. Indeed, literature often refers to these groups as distinct, as though they are outside of mainstream society (Clarkson and Coleman 2015). Yet, with global population aging poised to become one of the most significant social transformations of the twenty-first century (UN 2019) and noncommunicable diseases accounting for around three-quarters of all global deaths (WHO 2018), older and infirm consumers are certainly not outside the mainstream. Hence, we rejected this group of service design methods because they entail physical interaction with designers that would simply be impossible for many consumers.

This systematic reduction process left us with a much smaller, but nevertheless diverse and heterogeneous range of service design methods from which to choose. We considered these from Kimbell and Blomberg's (2017) typology of service design approaches. Each approach originates from different research traditions, focuses on different actors, and contains service design methods that perform differently. The first approach focuses on the service encounter, taking a wide perspective to include both the traditional interface between customer and service provider and also the interactions between customers and other actors. The

second focuses on value cocreation systems, i.e., the dynamic exchanges of resources that comprise both the organizational-level service system and the wider service ecosystem and value constellation. These two elements have clear similarities to the multilevel service design model proffered by Patrício et al. (2011) and discussed earlier insofar as both focus on the service encounter, though Kimbell and Blomberg's (2017) value cocreation system comprises both the second and third layers of Patricio et al.'s model as it incorporates both the organizational-level service system and the service concept. The way the two perspectives differ significantly is the identification of a third approach in Kimbell and Blomberg's (2017) typology. Called the socio-material configuration, it is "an assemblage of constituents which emerges through the dynamic unfolding of practice, providing interfaces through which actors engage with resources" (p. 84).

In Kimbell and Blomberg's (2017) typology, the designer focuses on the detail of the customer's interaction experiences from the service encounter approach; examining service at the micro-level. A wider lens then scrutinizes the value cocreation system, where the results of customer experience and its delivery via configurations of resources and processes through organizational-level and ecosystem levels are the primary considerations. Hence, the socio-material configuration approach demands the service designer's lens has a focus wide enough to consider the service from both a meso and macro-level, and is also able to zoom in to the minute detail of the customer experience at the micro level. The socio-material configuration approach therefore encompasses the customer's experience with the service encounter, multilevels of service, service networks, and indeed wider social systems in which services exist. From this perspective, the customer experiences value cocreation opportunities through a range of situational local actors. The service encounter approach certainly views actors as having agency, but the socio-material approach argues that agency emerges from inter-relating (Kimbell and Blomberg 2017). Clearly, this view resonates with S-D logic's perspective on value-in-context, which examines value cocreation from the perspective of the individual actor and from the wider perspective of the entire service ecosystem (Chandler and Vargo 2011).

Some studies have made significant contributions to take a multidimensional perspective to service design. Multilevel service design (MSD) (Patrício et al. 2011), discussed earlier, was the first service design method to address cocreation at hierarchical levels of service. However, these authors themselves acknowledge that although MSD provides some insights into service experiences beyond the service encounter level, what is required is further empirical research that takes a more holistic view of service experience and provides a richer conceptualization of value. Teixeira et al.'s (2012) study merged MSD with customer experience modeling (CEM) and provided the field with a holistic approach to examining customer experience at different levels of

the service hierarchy. This study attempted to overcome the limitations of most other models which focus on single elements of customer experience, and called for further integration of CEM with service design methods. However, as these authors acknowledged, the utilization of different diagrams to depict and orchestrate different elements of the customer experience was time consuming and cumbersome, concluding that software tools would be useful for such future projects. Building on their earlier work, Teixeira et al. (2017) produced a service design method known as MINDS (Management and INteraction Design for Service). MINDS merges management and technology-oriented standpoints in order to better represent customer-technology interactions, using MSD. MINDS enhanced the design of innovative technology-enabled services in two services (watching football and a skin cancer service) and effectively bridged the gap between management and interaction design for producing rich visual models for designing technology-enabled services. A further multidimensional service design method followed with SD4VN (service design for value networks), created to improve service design methods by going beyond the dyadic service encounter represented by many alternatives (Patrício et al. 2018). Integrated into SD4VN is a value network perspective to better understand interactions of network actors.

These novel multidimensional service design methods are leading the field by responding to the complexity of many modern services where networks and multichannel systems using ubiquitous technology have replaced the dyadic encounter. However, our design needed to incorporate multiple service levels in order to enable organizations to identify which, if any, provide opportunities for innovation. It needed to take a cocreation perspective and therefore analyze the different ways in which multiple actors and systems coordinate. Additionally, it had to put the customer at the heart of analysis in order to understand the ways in which they determine value. We wanted to understand how phenomenologically determined value occurs at the micro, meso, and macro levels, and identify how the reconfiguration of resources could lead to innovation via enhanced value cocreation opportunities. The service design methods outlined earlier could certainly contribute to designing multilevels of the current service offering, but we wanted one that took a deeper dive into the lived experiences of customers as they engaged with different actors throughout the different levels and interfaces of the service. We wanted to take the socio-material configuration approach to service design. Bringing these different dimensions together, our new methodology needed to (1) be easy to use; (2) systematically capture the tactic knowledge embedded in lived experiences of service users; (3) enhance understanding of value creation from the customer's perspective; and (4) uncover viable and practical opportunities for innovation. However, service designers had not yet proffered a technique incorporating the full spectrum of cocreation activities and

actors that the socio-material configuration approach demands (Frow et al. 2015; Fuentes and Smyth 2016). Consequently, we designed the TTT.

Rather than begin from a zero base, new methodologies benefit from empirical foundations by blending and aggregating existing methodologies (Domigall, Albani, and Winter 2013). This perspective is akin to situational method engineering (SME). In SME, the starting point is a method base, which is a set of existing method parts, comprising small portions of the new methodology. SME begins with an evaluation of the range of available method parts from the method base and selects those that are useful to construct a new methodology (Henderson-Sellers et al. 2014). Using the SME analogy, our method base comprised the full range of service design methods that we evaluated before rejecting many for the various reasons detailed previously. Of those that remained, we selected six, using Kimbell and Blomberg's (2017) typology to guide us. We evaluated and selected two methods from each of the three different service design perspectives. At the service encounter level we selected touchpoints and the servicescape. For examining service systems we chose service blueprints and customer journey mapping. In order to ensure depth of understanding of value-in-context (Chandler and Vargo 2011) and therefore incorporate a socio-material configuration approach, we chose experienced based co-design (EBCD) and rich pictures. Table 1 details these choices and our evaluation of them, outlining the reasons why no one single method was fully capable of meeting our needs; a (+) sign indicates the potential benefits and reasons why we chose these method parts, while a (-) sign indicates the limitations of each method. Armed with our method parts, we turned to design science research to build our new methodology.

Table 1 Here

Design Science Research (DSR)

DSR achieves two purposes simultaneously: it produces scientific knowledge and helps to solve real organizational issues (Hevner et al. 2004). DSR aims to extend the boundaries of organizational capabilities through creating and evaluating innovative artifacts. An artifact is any object that has an embedded research contribution in its design (Peffers et al. 2007). DSR overcomes the limitations of other approaches by ensuring conceptual models have empirical utility (Hevner et al. 2004), so differs from design thinking. To illustrate, when applied to service research, a design thinking perspective would concentrate on the service experience itself. In contrast, DSR focuses on creating a better artifact that can delve more deeply into user experience and therefore enhance understanding of the service experience. Ultimately, the design of improved service systems can emerge from a better understanding of user experience, and practical applicability to solve a problem is an essential requirement of DSR (Hevner et al. 2004). At the same time as seeking to reduce the theory-practice

gap, DSR upholds rigor to ensure reliability of results (Dresch et al. 2015). DSR is both creative and goal-oriented: creative insofar as the artifacts are innovative and artistic, and goal-oriented in that these artifacts are applied to important problems and then rigorously evaluated for their potential to transform organizational strategies and processes (Hevner et al. 2004). In other words, the goal of DSR is research utility.

DSR is well-established in the field of Information Systems. Only recently however have service researchers turned to DSR, perhaps because service design lacks suitable methods to deal with modern complex services (Teixeira et al. 2018). Examples of service design methods developed using DSR are MINDS (Teixeira et al. 2017) and SD4VN (Patrício et al. 2018), discussed earlier. These novel applications exemplify the ways in which academe, through a rigorous, creative, and innovative process, can push technological frontiers further and respond to requests from organizations for solutions to their problems (Dresch et al. 2015). The remainder of this paper explains how we employed DSR to build the TTT in response to such a request.

METHODOLOGY: USING DSR TO CREATE THE TTT

We utilized the 6-step DSR procedure advocated by Peffers et al. (2007), a tried and tested process for use in service design research (Teixeira et al. 2017) and well suited to our purposes. Figure 1 outlines the 6 stages and applies each of them to the development of the TTT.

Figure 1 Here

Stage 1: Problem identification and motivation

The preceding review of service design methods demonstrated the lack of one that incorporates the full spectrum of cocreation activities that the socio-material configuration approach requires. Hence we needed to build a new *enabling* methodology with the key aims of harnessing customer experiences, emphasizing value creation within and between service systems, and spotlighting those service aspects that do add value as well as opportunities for potential innovations through enhanced value cocreation. These broad goals would provide various organizations with a service design methodology that bridges the gap between S-D logic's theoretical focus on value cocreation and resource integration, and a practical technique needed for implementation. Certainly, such a methodology is called for (Fuentes and Smyth 2016; Vink, Wetter-Edman and Aguirre 2017).

Additionally, we faced several problems specific to 'Red Hospice', the organization that first approached us. First, policy makers had told them about the need to ensure they are 'patient centered' but beyond the clinical encounter, already rated as excellent, they did not know how to begin to approach this. Second, the abundance of previous research into consumer satisfaction (both qualitative and quantitative) they

already owned revealed outstanding evaluations: lending no clue as to how the service could improve. Third, we discovered a situation where customer satisfaction research typically relies on retrospective family surveys, on the basis that patients themselves are too ill to participate. This meant we faced a position where some key service users were not involved in service design decisions. Finally, in our specific case we faced a hesitancy, prevalent among society, to discuss mortality (Giovanni, 2012). Consequently we were dealing with a taboo subject.

Stage 2: Defining the objectives for a solution

Building on our objectives outlined earlier, our new methodology needed to:

1. *Be easy to use*. This relates to ease of use for the researcher/service provider, and for the service user, including the elderly, disabled, and other marginalized consumers.

2. *Systematically capture the tactic knowledge embedded in lived experiences of service users.* Capturing customer experiences of value is methodologically challenging (Jüttner et al. 2013), and many of these challenges were heightened in our specific case.

3. *Enhance understanding of value creation from the customer's perspective.* S-D logic stresses that the beneficiary uniquely and phenomenologically determines value; both S-D logic and the socio-material configuration approach to service design posit that value emerges in context within interconnections of tangible and intangible resources.

4. *Uncover viable and practical opportunities for innovation*. We needed an *enabling* methodology: a practical way to transfer understanding of value cocreation into opportunities to reconfigure resources within and between service systems and the different levels of the service hierarchy.

Stage 3: Design and Development of the TTT

Kernel theories

A kernel theory is any theory that informs artifact construction (Gregor and Hevner 2013), while a theory-ingrained artifact is one which is actively inscribed with recognizable theoretical elements (Sein et al. 2011). Our earlier discussion detailed several key ways in which the metatheories of S-D logic and cocreation informed the design of the TTT. We also viewed the specific problem of 'patient centeredness' as value cocreation. As part of the larger transition from passive to active consumption in healthcare, recent thinking on patient-centeredness takes a broader, organizational perspective that goes beyond the clinical encounter to

examine structures, cultures, and processes that impact patient experience (Liberati et al. 2015). Indeed, the Royal College of Nursing explains person-centered care as the need to make systems suit users, rather than the other way round. Couching this issue as one of value cocreation enabled us to view the problem in broader terms, applicable to a wide range of service organizations.

Second, our case presented with an extreme form of cognitive appraisal. Cognitive appraisal is a consumer coping strategy that may explain why large numbers of customers do not complain directly to the service provider (Stephens and Gwinner 1998). Attachment theory (Bowlby 1969) best explains our extreme case in terms of reluctance for customers to voice complaints. Attachment theory suggests that increased dependency triggers feelings of extreme vulnerability and a crisis of attachment that leads some people to seek and establish closeness (actual or perceived) with a care provider. This closeness leads to a tendency for people to agree that the service is superb solely on the basis of interpersonal relationships formed with the caring staff (Churchman et al. 2014), hence it is not unusual for some service providers to receive overwhelmingly excellent feedback and few complaints. Encouraging customers to voice any dissatisfaction leads to opportunities to remedy problems by improving the service (Stephens and Gwinner 1998). The TTT therefore needed to recognize this potential barrier; as well as acknowledging that interpersonal relationships are important, the new methodology had to go beyond the encounter and encourage people to talk candidly about their experience.

Third, we had a case where research often omits key service users from samples, on the basis that hospice patients are too ill to participate (Dy et al. 2016). At best, from a value cocreation perspective, omitting sick, disabled, or vulnerable people from service research because it is too difficult to capture their voices is a flaw in the service design process (Anderson, Nasr, and Rayburn 2018). At worst, it constitutes an unacceptable but systemic form of exclusion (Coggin 2008). The systems theory of disability questions the medical model of disability (handicapped due to incapacity or impairments) on the basis that disability results from obstacles in society. In other words, people are only handicapped if society does not take account of their impairments (Michailakis 2003). However, our case may not be as unique as first surmised: despite their growing numbers, research still routinely excludes older and disabled persons (Key and Culliney 2018). As previously mentioned, increasing numbers of consumers will be aging and frail. Hence, we based our design decisions on the concept of inclusive design, which underscores user diversity and views design decisions as having the potential to include or exclude people due to capability variations (Clarkson and Coleman 2015). The new methodology needed to be easy to use, even with people who are old, sick, or vulnerable.

Finally, we designed the TTT in such a way as to encourage people to talk about difficult, personal, and even taboo subjects. As Alinsky (1971, p. 79) famously states, "happenings only become experiences when they are reflected on, related to general patterns, and synthesized", hence the design needed to encourage deep reflection in order to help people to translate their happenings into experiences. Based on the premise that people think narratively as opposed to argumentatively or paradigmatically, narrative theory posits that stories and storytelling are central to achieving a deep understanding of consumers (Woodside, Sood, and Miller 2008). Narrative theory also postulates that most information stored and retrieved from memory is episodic, hence encouraging people to tell their stories is an effective way to recall incidents, experiences, and evaluations. Finally, narratives allow people to share with the researcher their experiences, as opposed to the researcher imposing their beliefs in the form of predetermined interview or survey questions on the research.

Data collection, analysis, and feedback procedures

The TTT encourages participants to feel free to talk about any dimension of their experience that resonates with them, and allows people to add any omitted touchpoints. Nevertheless the process needed kick-starting so we identified as many potential touchpoints as we could. Starting with blueprinting and the servicescape to remind us to include multiple tangible and intangible service dimensions, we drew on numerous sources to identify potential touchpoints, including academic palliative care literature, experiential consumption literature, policy documents, interviews with a variety of staff, introspection, unstructured interviews with several service users, and observation. Online Appendix A gives a detailed account of these sources.

We then grouped these into potential touchpoints into 5 logical journey stages and 2 servicescape dimensions:

- *'Pre-Arrival'* (journey stage 1) details the customer journey up to the point of experiencing the service;
- *'Arrival'* (journey stage 2) illustrates those touchpoints a customer may come into contact with as they first begin to experience the service;
- *'Care and Support'* illuminates the core service aspects provided by frontline staff;
- *'Facilities'* depicts the non-social dimensions of the servicescape;
- *'Shared Spaces'* portrays the social dimensions of the servicescape;
- *'The Little Extras'* show those augmented aspects of the service;
- '*Final processes and aftercare'* depict the completion of the core service and the aftercare experience.

Online Appendix B provides a detailed example of our 7 sets of potential touchpoints.

We then transformed each individual potential touchpoint into a rich picture image using photographs, clip-art cartoons, and easy to recognize signs and symbols. As will be detailed later, testing and refinement resulted in various adaptations to these images. Figure 2 illustrates one early version and one finalized version of the groups of touchpoints. Online Appendix C provides a color version of a finalized touchpoint group. We uploaded each group onto tablets and printed them onto large laminated cards.

Figure 2 Here

The TTT is more than just a set of 7 picture cards. It is a full methodology for uncovering in-depth stories of customer's lived experiences at the same time as ensuring systematic data collection and analysis. Figure 3 details this methodology. Narratives are audio recorded, transcribed verbatim, and subjected to manual thematic analysis where 2 researchers independently analyze the data then compare and collate their analysis. Initially we used NVivo software but found manual thematic analysis superior in understanding the nuances in the data.

Figure 3 Here

Additionally, we designed a built-in knowledge transfer system. Empirical utility is a key objective of DSR, yet understanding how an organization absorbs new customer knowledge is limited (Storey and Larbig 2018), though we did acknowledge that busy frontline staff would not read large and detailed reports containing results. Key opportunities for innovation are often in the emotional content of data (Coghlan and Prokopoff 2004); hence the new technique should not strip results of that emotion. Yet, to ensure findings from the TTT make a real difference, it is important that staff of every level are on board. Consequently the TTT has feedback posters as an integral part of its design. Each of the 7 sets of touchpoint cards has its own feedback poster, complete with the touchpoint images to link different customer journey dimensions to the customer's narrative. Each feedback poster comprises 4 sections: aspects of service that are excellent, areas for improvement, recommendations, and a section based on the 'you said we did' concept, which encourages staff from different levels to respond to the findings with ideas on post-it notes. Involving staff in this way effectively treats them as operant resources, as suggested by S-D logic (Edvardsson et al. 2010). Online Appendix D illustrates a feedback poster.

Design Theory

In addition to an artifact, a DSR project produces a special type of theory, a so-called design theory or theory for design and action (Gregor 2006). A design theory comprises the class (generalized) requirements and

the general components the artifact has to possess to meet the class requirements, as well as the design process which is the sequence of activities required to design the artifact. Capturing and formally codifying the design effort in producing a problem-solving artifact ensures it is valuable to both research and practice (Kuechler and Vaishnavi 2012). The basic premise is that a design theory formally codifies design knowledge that is applicable to a class of problems rather than solely the individual problem for which the artifact was produced (Gregor and Jones 2007; Sein et al. 2011). Design theories differ epistemologically from our central understanding of theory for analysis, explanation, and/or prediction and are therefore sometimes unrecognizable as theories (Gregor and Jones 2007). However, if we view prescription as akin to prediction, we can see that a design theory is essentially a theory about how to do something which, when acted upon, causes a certain type of artifact to come into being. Hence the knowledge captured in a design theory serves a practical purpose (Gregor 2006). As Van Aken (2004) argues, understanding a problem is only halfway to solving it; we need prescriptive theories useful for designing solutions to a class of organizational problems. He pleads for the development of what he terms management theory as field-tested and grounded directions that serve as design exemplars of managerial problem solving. Unlike conceptual research which provides general enlightenment, he calls for more instrumental use of research involving acting on results, which he argues is actually a more ambitious objective.

Design science theories do, however, go beyond prescriptions to also include functional explanations of why artifacts have certain attributes. Baskerville and Pries-Heje (2010) argue a design theory should comprise two distinct constituents: an explanatory constituent and a practice constituent, as illustrated in figure 4. The explanatory design theory embodies the class requirements (conditions or capabilities) and a generalized set of features to satisfy these. The purpose of the explanatory design theory is therefore to explain a range of phenomena rather than a specific instance of a problem: requirements specify and explain the need for components, and components are justified by the requirements. The second constituent, the design practice theory, prescribes in a practical way how to design the artifact, and makes propositions that describe, explain, and/or predict its utility. Following this argument, conceptual understanding of S-D logic and cocreation still leaves undone a practical technique to use them instrumentally. The theory that emerges from our DSR project therefore comprises an explanatory design theory containing the generalized requirements and components needed for an artifact for service professionals (managers and researchers) who want to act upon and apply the key theoretical principles of S-D logic to service design in order to innovate through enhanced cocreation opportunities with an inclusive, easy to use methodology. The design practice theory comprises a field-tested prescription that provides direction on how to build this methodology. Table 2 details the design theory.

Figure 4 and Table 2 Here

Stage 4: Demonstration

An instantiation is the realization of an artifact in its environment (Hevner et al. 2004). This realization is the focus of this section. Figure 1 divides the 6-stage DSR process into 2 major phases: build and evaluate. Stage 4 (demonstration) and stage 5 (evaluation) have some degree of overlap, but demonstration is akin to 'proof-of-concept' evaluation, while stage 5 is much more rigorous and comprises a full evaluation of how the artifact supports a solution to the problem (Tuunanen and Peffers 2018). In order to avoid duplication, we limit this section of the paper purely to detailing the demonstration, and address evaluation in the next section.

We concentrate primarily on our collaborations with hospices and palliative care organizations for evaluation of the TTT, as this phase of our research provides a richer case study in which to demonstrate its utility. However, in order to demonstrate a rigorous evaluation (and test proposition 5 of our design theory), we did adapt the TTT for use with single applications in one related service (a hospital medical/surgical unit) and one unrelated service (a veterinary practice). These latter instantiations testify the applicability of the TTT to organizations outside hospice and palliative care services. Table 3 details the collaborating organizations.

Table 3 Here

We used a purposive sampling approach with a selection criteria aimed at achieving maximum variation within the sample. Our collaborating hospices serve populations with very different socioeconomic profiles, from leafy suburbs in affluent parts of England, to inner cities noteworthy for health inequality gaps. Our sample includes a variety of service users (inpatients, outpatients, family caregivers, bereaved) from different socioeconomic statuses (from a homeless person to a variety of professionals), a mixture of ethnic groups, and a wide age range: our oldest participant was 91 years, while our youngest was 13. Purple Hospice is noteworthy because it is a children's hospice: Purple Hospice patients were children, while one relative was a child sibling. The two remaining organizations offer palliative care services in different ways. Both connected to different major hospitals, one comprises a specialist inpatient unit while the other consists of a hospital-based team supporting patients newly diagnosed with incurable conditions. Analysis of Red and subsequently Blue and Yellow hospices confirmed saturation levels occurred at approximately 20 narratives; consequently the samples are smaller for the remaining hospices. As the hospital-based service differed operationally to the main hospices, we increased the sample size for this organization, but analysis revealed the same saturation point.

We then demonstrated the utility of the TTT outside palliative care and indeed outside the UK when we used an adapted version to capture the lived experiences of 25 patients from the MedSurg (Medical/Surgical)

Unit of a large New York hospital. Unlike Red Hospice (and indeed most of the other hospices in our sample), this hospital lags behind both state and national averages in patient satisfaction ratings. Management owned data highlighted service aspects that fell below average, though they did not have in-depth understanding of patient experiences behind the metrics. Even a cursory glance at instruments such as the HCAHPS Survey (Hospital Consumer Assessment of Healthcare Providers and Systems) which aims "to meet consumer demand for objective, comprehensible data on the performance and care quality of individual hospitals" (Moriarty 2017), reveals that most response options are 'never, sometimes, usually, or always'. Metrics provide managers with overall average satisfaction ratings for each question. An example of a question is "how often did you get help in getting to the bathroom or in using a bedpan as soon as you wanted?" It tells us little about the patient's perception of the help they needed, the frequency of the help, how they felt when they were waiting, and perhaps more importantly how they felt if they were waiting too long. Nor does the survey give caregivers or close relatives a say. In contrast, the TTT gives all service users a voice. Consider the difference in a metric to the following quote from a narrative about an event that happened at a hospital prior to the patient being transferred for hospice care: *"we nipped off for about an hour and when we got back my Dad was sitting in a pool of urine, soaked completely and his buzzer was going off, and the two men opposite said we have set off our buzzers as well as your Dad has been buzzing for ages and no one has come, and when we got to him bless him, he said I just couldn't hold on anymore and I am so sorry, and he was crying, his dignity, it was awful…"*

One could argue that these dissimilarities are simply due to difference in nuance between qualitative and quantitative techniques. However, we did not ask any direct or specific questions about bedpans or toilets; we simply put a 'care and support' image card in front of participants. Responses comprised what was important to them, what mattered, their experiences, their feelings, their emotions. This lack of direct questioning is important, as the TTT image cards eliminate some interviewer bias. A large body of literature details the effects of human interviewers on data collection processes, with face-to-face methods usually producing the largest effects (West and Blom 2017). Because the TTT does not rely on specific questions, bias originating from the ways questions are asked, and a variability between different interviewers, is eliminated.

Our use of the TTT to capture the lived experiences of customers of a veterinary practice (some had pre-booked routine appointments, some left their pets for surgery, others had medical emergencies) took a little adaptation insofar as many images (e.g., the little extras card) were unnecessary. We also changed images of doctors to images of vets with dogs and cats. However, the 6 remaining touchpoint cards stayed. Importantly, the same design rules (detailed in table 2) applied, lending evidence to support the generalizability of the TTT to

services outside human health. The TTT again enabled rich detail of the perceptions (and misconceptions) about the service, and deep insights into customer experiences with booking systems, the waiting rooms, queueing at reception to both check-in and pay, and even issues with the outside servicescape (grass verges with dog waste). Previously, this practice had administered various quantitative surveys but the data that emerged from the TTT study was richer, deeper, and uncovered aspects of the service not previously considered.

In sum, the TTT has to date been demonstrated in conjunction with 3 different types of services, across 9 different organizations, and with 240 diverse service users over a period of over 4 years. This level of demonstration and evaluation to ensure an artifact works over a range of contexts is richer than that usually applied to much social science (Peffers, Tuunanen, and Niehaves 2018) but such rigorous evaluation of a DSR artifact is essential (Peffers et al. 2012) in order to provide the evidence which differentiates design from design science research (Venable, Pries-Heje, and Baskerville 2016). Consequently it is to the evaluation of the utility of the TTT that we now turn.

Stage 5: Evaluation of the DSR outputs

Rigor is a major consideration when deciding how to answer the fundamental DSR questions of 'what utility does the new artifact provide?' and 'what demonstrates that utility?' (Hevner et al 2004). Conceptually, evaluation comprises empirical evidence or logical proof of the utility of the artifact (Peffers et al. 2007). This important stage necessitates a clear evaluation strategy (Hevner et al. 2004; Peffers et al. 2012), so we use the 4-step framework advocated by Venable et al. (2016), applied in figure 5.

Figure 5 Here

The starting point of the strategy considers the evaluation's functional purpose. Formative evaluation helps to improve outcomes, while summative evaluation judges outcomes against expectations (objectives and design theory propositions). Consideration of the evaluation paradigm also occurs early in this process, and while positivistic laboratory based artificial evaluation can be useful for information systems and software development, we of course chose naturalistic evaluation which is interpretivist and takes place in a real environment (Hevner et al. 2004). In our case naturalistic evaluation took place with 9 different organizations. Our choice of the 'human risk and effectiveness strategy' (stage 2) is therefore subject to the intricacies and convolutions of organizations and indeed human behavior; but is worthwhile because such DSR evaluations lead to stronger internal validity and testing of the design theory (Venable et al. 2016). The third stage of the framework demands consideration of what DSR outputs to consider. Clearly, we need to evaluate the physical artifact (the touchpoint image cards) and the whole TTT as a methodology (see figure 3) to meet our 4 DSR

objectives. As shown in the final section of figure 5, we designed an evaluation strategy that utilized both formative and summative evaluation in relation to objective 1. We used summative evaluation for examining utility against the remaining objectives. Embedded within our evaluation against objectives is consideration of performance in relation to our design theory propositions. Our earlier discussion already provides some details of the ways in which our kernel theories and existing service design methods helped meet our data capture objectives. The discussion that follows builds on our earlier narrative.

Objective 1: Ease of Use. Formative evaluations via the tight coupling of design-evaluation-iteration can produce empirically based reasons for improvement (Venable et al. 2016). Three such reasons led to major design changes. An early change occurred with the relatively quick realization that people smiled at the brightly colored cartoon pictures, while the other images did not have the same impact. A color version of the TTT images is available in Online Appendix C. Note the difference in the versions of the touchpoint images in figure 2. Feedback was clear: to participants, the brightly-colored cartoons were preferable to the more realistic photograph-type images. While anthropomorphism informs consumer storytelling theory focusing on brands (Woodside et al. 2008), and cartoons are used in some projective techniques, we had not expected this aspect of narrative theory to be applicable to our experiential research into healthcare services. Yet, undoubtedly, the cartoon images made people smile and put them at ease. Psychology research suggests that anthropomorphism acts as an underlying attempt to attain mastery of one's environment, particularly when perceived as uncertain and unpredictable (Waytz et al. 2010). Perhaps, in a similar way, our cartoon images somehow lessened the feelings of uncertainly and unpredictability that many of our respondents certainly expressed about their situations. Unquestionably, our cartoon images made people feel better: the content of the narratives may have been distressing, but the methodology did not have to be. Consequently, the first major iteration was to update the touchpoint images to cartoons, as illustrated in the second image in figure 2.

The next change comprised additions to touchpoint images. Based on S-D logic's construct that beneficiaries are the only people who can determine value, the TTT encourages people to select their own touchpoints (from a predetermined selection and/or their own) in order to map out their own unique journey. This is in contrast to many service design processes where actors other than customers usually design journey maps (Zomerdijk and Voss 2010), and only recently has research suggested that customer input is required (Lemon and Verhoef 2016). The touchpoint image cards gave participants control (a general component within our design theory); they were free to include in their unique stories of their unique experiences those service aspects (tangible and intangible) that were important to them, which may not be the same as those intuitive to

providers (Hagensen et al. 2016). While our results revealed deep and vital issues around central service dimensions (in our case, pain management, ease of suffering, dignity, and quality-of-death), this control enabled the revelation of an assortment of seemingly small details that actually transpired to be very important. An example is haircare, emerging as particularly crucial for female cancer patients, *"when you're stuck in a bed all day every day, it's the one thing you love having done"* (Patient); "*she was always fussy about her hair and the little hair clips she used to wear, and she would say "oh look at the state of my hair!"* (Bereaved). Other examples of areas easily overlooked in predesigned surveys that emerged as crucially important - and hence demanded inclusion into the TTT cards - were pets and pet therapy, being able to take a bath rather than a shower, and the importance of music. It is highly unlikely that such concerns would have been uncovered had we used a quantitative survey or even pre-determined questions in a semi-structured interview. Images for these touchpoints were duly added, mainly to the 'little extras' touchpoint card (see figure 2).

The third major change entailed additions to the first and to a lesser extent the final touchpoint set. This transpired after it became clear that people wanted to talk about their extended customer journeys. Hence, this change resulted from feedback of the product artifact (the images) and the process (the methodology). Our original understanding of the need for a pre-arrival group of touchpoints related mainly to communication and information sources pertaining to the service. However, it soon became clear that participants needed to talk in-depth about their journey prior to service access. It was clear from an early stage of demonstration that the original touchpoint images were not comprehensive enough to incorporate these issues that were crucially important to understanding the customer's journey holistically. It was in the pre-arrival stage that we added the most touchpoint images: the final version of our pre-arrival card includes touchpoint images depicting care co-ordination and the roles of other ecosystem actors (in our example, hospital doctors, and community nurses). Likewise, demonstration necessitated the addition of images pertaining to issues post-service (in our case, coping with grief, caring for the caregiver, and the impact of the service on the quality-of-life of bereaved families). We learned from this extended journey concept when designing the touchpoint images for the MedSurg unit and the veterinary practice, and we again witnessed the same phenomenon: people needed to explain their extended customer journeys, and to them their stories were incomplete without the ability to do so.

Summative evaluation of the touchpoint images revealed very positive participant reactions. Comments such as, "*oh what a clever way of doing it!"* (Patient) and *"these are very well done!"* (Bereaved) were commonplace. Underpinned by the systems theory of disability, the TTT encompasses inclusive design principles. One of our respondents was illiterate, one had severe learning disabilities (including being deaf, and

therefore used the TTT cards and spoke to us through a translator), and several were initially hesitant about joining the research until they heard there were no forms to fill in. Many of our participants were extremely physically and emotionally vulnerable: two of our respondents had motor neuron disease (one narrated her story using speaking software), many had different types of cancer, and several had heart disease or COPD, yet all participated in the research willingly and without problem. We also used the TTT with children. In other words, the TTT is easy to use and inclusive: neither disability nor vulnerability constitute exclusion from service design research when using the TTT. Additionally, the TTT was easy to administer. No location problems emerged, while we found the pictures to be invaluable in enabling us to concentrate on what respondents were saying during their narratives, rather than us checking interview schedules. Because of the reliance on cartoon images, the TTT eliminates both inter-interview bias and bias from the ways in which an individual interviewer asks questions. Additionally, the cartoons also ensured we came across as friendly and informal in a way that perhaps interview schedules and clip-boards could not: *"you've both been so kind, it was thoughtful and you made me feel at ease"* (Bereaved).

Objective 2: Systematically capture the tactic knowledge embedded in lived experiences of service users. Striking was the number of participants who initially doubted they had much to say, only to later express surprise at how long they had spoken for, *"gosh, I didn't think I had that much to tell you!"* (Caregiver). The average inpatient interview lasted 20-30 minutes, the average family caregiver 45 minutes, with some exceeding 2 hours. Certainly evidence to support the episodic nature of information storage and retrieval emerged with the rich pictures acting as an aide memoir, and common responses included, *"oh that reminds me!"* (Caregiver). When concluding discussions, we always gave respondents an opportunity to mention anything else they wished; overwhelmingly responses were, "*you have gone through everything so thoroughly, thank you very much"* (Patient). In other words, the TTT does enable a 'deep dive' into the experiences of service users without being overbearing or intrusive. We found no evidence of the reluctance to discuss mortality that is so prevalent in society (Giovanni, 2012), nor did we find a reluctance to talk deeply due to an attachment for caring staff. There are several possible reasons for these positive results. First, it may be that the cartoon images allowed people to talk in a more abstract and less personal way about their care staff. Second, it may be that the control given to respondents over their narratives, either through the cartoons and/or through their control over touchpoint selection, or through the absence of any predetermined questions, allowed people to feel comfortable enough to narrate deep feelings and experiences even about these taboo and personal issues. In fact, despite the serious story content, some participants felt the process was therapeutic, "*It was important for his story to be*

told and I'm glad I've done it" (Bereaved), while expressions of gratitude and feelings that the research is meaningful were commonplace, *"It shows that you people appreciate me and you are listening"* (Patient).

The grouping of the touchpoints along the customer journey ensured systematic data collection, and vastly aided systematic data analysis. The journey concept kept people on track, encouraging narratives that started before they accessed the service in question. This starting point proved invaluable in enabling these organizations to better understand their role in their wider ecosystem and indeed the need for better integration with other relevant service providers.

Objective 3: Enhance understanding of value creation from the customer's perspective. The control given to participants by allowing them to select their own touchpoints and therefore map their own unique journey, coupled with narratives rather predetermined questions, enabled us to understand value cocreation from the perspective of the customer. Narratives revealed holistic and minute details of unique and contextually determined value that incorporated different levels within and between the service hierarchy and in interdependencies between service systems. Our evaluation of whether or not the TTT meets objective 3 is perhaps best summed up in this quote from one Hospital Trust executive, *"…in the development of this novel approach of patient engagement for evaluating the quality of clinical care, findings have illustrated the approach uncovers data which had hitherto remained hidden/undisclosed using traditional approaches. The collaboration seeks to maximize the learning and innovation from different clinical and academic sectors, to address a problem which has often been tackled from a singular perspective – with limited success…. We are already exploring additional areas where the TTT may provide novel solutions to longstanding clinical problems."* Clearly, the TTT provides a practical approach to expanding the focus of inquiry from the service encounter to the whole customer experience, with the rich description containing numerous novel insights into how customers view value creation.

The use of posters (appendix D), as opposed to in-depth reports to which frontline staff would have no access, emerged as an effective way of ensuring all staff were given the opportunity to enhance their understanding of value creation. We invited staff to presentations that followed the format of the posters: for each of the groups of touchpoints (appendix B), we told them which aspects of service were excellent and which provided opportunities for improvement. Pointing out those service aspects that are excellent is an important part of the TTT, after all, this enabled organizations to better understand value creation from the customer's perspective. At the same time, using the voices of service users in this feedback to staff resonated with them. Impact on individuals is an important aspect of artifact evaluation in DSR research (Hevner et al. 2004). In more

than one instance, frontline staff, visibly moved during feedback, cited the patient voices to be particularly poignant. The liberation of knowledge from artifacts is a central issue in DSR (Chesbrough and Spohrer 2006), and we found the feedback posters to be integral to the TTT as a methodology to enhance understanding among staff of customer value creation.

Objective 4: Uncover viable and practical opportunities for innovation. This final evaluation section considers the performance of the TTT as an enabling methodology. We set out to design a practical way to transfer understanding of value cocreation into opportunities to reconfigure resources within and between service systems and the different levels of the service hierarchy. The TTT meets this objective. Although the rich and thick description that emerged from the systematic capturing of lived experiences of service users comprises over 1.5 million words and evaluation of results is beyond the scope of this methodology paper, in this final evaluation section we appraise the TTT with some examples of the innovations that came about as a direct result of its use. In their analysis of the ways in which service research and service design has evolved, Foglieni et al. (2018, p. 10) stress that "service must be considered more a perspective on value creation than an activity or a category of market offerings". Recall that our earlier discussion stressed that people-centeredness is essential to service design. Indeed, a design *for* service approach (Kimbell 2011; Meroni and Sangiorgi 2011; Wetter-Edman et al. 2014), views service innovation as the creation or alteration of conditions where actor interactions occur. These interactions take place over time. Consequently, service innovation is about the ways in which resources and actors are reconfigured in order to enhance situations for customers (Edvardsson et al. 2010; Meroni and Sangiorgi 2011). We classify our examples of these innovations using the Multilevel Service Design (MSD) model (Patrício et al. 2011). Table 4 illustrates some of these value enhancements – or innovations –within all three hierarchical levels.

Table 4 Here

Redesigned service encounters better reflect user needs, from communication channels (less reliance on leaflets and web site, more on ways to encourage word-of-mouth and face-to-face interactions), through changes in clinical protocols around the area of advance care planning for improved clinical encounters. The increased availability of hospice volunteers, including all night every night, means people are less frightened and isolated. Numerous changes to the service delivery systems of individual organizations have occurred, from simple things like improving the Wi-Fi, purchasing audio books, and arranging mobile hairdressers, through changing protocols at different stages in the customer journey, and even to clinician's employment contracts, all of which enhance value from the customer's perspective. At first glance many of these changes may not seem particularly

far-reaching, and indeed would fail to be classified as radical using the traditional innovation classification systems. However, as we have argued throughout this paper, when viewed from a customer value perspective, a different picture emerges. Conditions where seriously ill people, due to the effects of chemotherapy, no longer have the pleasure of reading a book, or are stressed because they are losing their hair, now have these situations enhanced through audio books and mobile hairdressers. Frightened people, many facing their own mortality, now feel less isolated due to the availability of volunteers at any time of the day or night. More bereaved families, desperate for counselling and support, now have a network of people to turn to. Clearly, when viewed with empathy, from the perspective of the service user, these seemingly little things become considerable enhancements to situations for customers. The ways in which customers realize value from a holistic standpoint has led to many further and significant innovations. Efforts are still ongoing to better integrate actors in the wider health ecosystem, but those already initiated include staff training and networking across healthcare organizations, and more focused communications to ensure the right information reaches clinicians who may be required to make a hospice referral. These changes are putting into place the conditions in which actor interactions occur, paving the way for greater value creation and enhancement for the future.

Perhaps one of the most significant innovations already realized as a direct result of the TTT is Red Hospice's launch of its new Hospice@Home service. Red Hospice launched this addition to its service portfolio as a result of a better understanding of their customer's full journey, particularly the crisis levels some families experienced before they arrived at hospice. Application of the TTT also uncovered a major issue: while users were grateful for the hospice services, many would have preferred to die at home. For some families, this last wish had gone unrealized, despite major efforts. The impact of artifacts on organizations and individuals is a crucial consideration of DSR (Hevner et al. 2004), particularly the observable effects on people and society (Peffers et al. 2018). In the first 5 months of operation, the new Hospice@Home service reached 175 new patients and their families. In that short period, the service avoided over 50 hospital admissions, and more importantly from a value creation perspective, enabled 102 people to attain their preferred place of death.

Stage 6: Communication

Through various communications we have highlighted the rigor, utility, and ease of use of the TTT to several other hospices and palliative care providers who then requested our collaboration. There are plans in place to present the TTT to a major national networking event to further UK hospices. Of equal importance, the research team recently accepted an invitation to the UK Parliament to share results in order to inform the All-Party Parliamentary Group on Hospice and Palliative Care. Through our own networks we were able to

communicate the theoretical benefits of our TTT sufficiently in order to convince the New York hospital and the veterinary practice to collaborate with us, thus demonstrating the utility of the TTT outside the service for which it was originally designed. By communicating our DSR artifacts to the wider academic community, we hope a wide array of service researchers utilize the TTT and find it to be as successful as we do.

CONCLUSION

This paper has detailed the design, development, and implementation of the Trajectory Touchpoint Technique (TTT), a deep dive methodology that harnesses customer experiences for enriched understanding of value throughout multilevel service components to ultimately increase innovativeness. Driven by S-D logic, the ways in which service innovation is viewed is shifting in emphasis from one focused on outputs to one focused on customer value and experiences (Skålén et al. 2015). Theoretically, S-D logic's framework enriches understanding of value cocreation by focusing on value-in-use and context and always from the customer's perspective. The lens of S-D logic views service innovation as creating and reconfiguring resources to transform the design, delivery, and perceptions of services. However, S-D logic lacks the practical techniques that organizations need to guide them in the ways they can gather the unique insights into value cocreation and then reconfigure their resources to innovate through enhancement of value. Service design, with its abundance of practical methods, is increasingly suggested as the way to bridge the gap between the theoretical perspective of S-D logic and the tools and techniques needed to operationalize it (Wetter-Edman et al., 2014). However, despite recent suggestions that the merging of S-D logic and service design is a way to design for service (Kimbell 2011; Meroni and Sangiorgi 2011; Wetter-Edman et al. 2017), service designers had not yet developed such a methodology, and research had offered little guidance on how to achieve these synergies. The TTT therefore fills this gap.

We contribute a nascent design theory that meets meta-requirements (Gregor and Hevnor 2013), generalizable to a wide variety of organizations. Our class requirements are based on current thinking which demands that service design and innovation must emphasize value and experience (Skålén et al. 2015; Vargo and Lusch 2008) within and between different levels of the service hierarchy (Patrício et al. 2018). S-D logic decrees that customers uniquely and phenomenologically determine value, and there is widespread agreement that customer involvement in the innovation process is crucial (Edvardsson et al. 2010; Lusch and Nambisan 2015). Consequently, we added general components that the artifact needed to possess, specifically articulating the need for a service design methodology that would systematically capture the rich and thick description of

customer's service experiences throughout their whole customer journey, incorporating different aspects and levels of the service. Based on the fact that global populations are aging, but are doing so without optimum health, we wanted this methodology to incorporate inclusive design principles, ensuring it was applicable to all. Finally, through a process of systematic and value-focused thematic analysis, we specified that the methodology needed to uncover viable opportunities for resource integration in order to improve service for customers. In order to achieve this, the methodology also needed to incorporate an accessible knowledge transfer process, effectively utilizing staff as operant resources. Clearly, these requirements and components are not limited in their applicability, and are relevant for a wide variety of service organizations.

The second component of our nascent design theory is the practice theory, which prescribes in a practical way how to design the artifact so that other researchers within other organizations can use it. Though the granularity of kernel theory constructs are often difficult to map into design goals (Kuechler and Vaishnavi 2012), we have detailed the ways in which salient propositions within our kernel theories and chosen service design methods blend together to build a methodology that meets the class requirements. We have detailed how the application of narrative theory and EBCD leads to storytelling which, in turn, provides rich and deep understanding of customer's lived experiences and perceptions of value. Mindful of the systems theory of disability, the TTT uses rich pictures to ensure inclusive design: people do not need to be able to read, write, or physically interact with researchers or designers in order to have their voices heard, which is important given projections relating to health and aging in the future (UN 2019; WHO 2018). Rich cartoon pictures overcome problems of discussing taboo issues by introducing them without the need for direct questioning, while the pictures provide a standardized way of collecting data that eliminates sources of interviewer bias. The concept of customer journeys with touchpoints encourages rich narratives, as stories have a beginning, a middle, and an end, while enabling people to select from a wide range of potential touchpoints acts as an aide memoir and effectively assists recall of episodic memories. Selecting their own touchpoints also ensures customers are able to map their own unique journey, based on S-D logic's insistence that value is uniquely, phenomenologically, and contextually determined. Stressing the holistic nature of the experience via customer journey narratives also overcomes a focus solely on the service encounter and therefore negates the prominence often resulting from feelings of intimacy with front-line actors. Our design theory therefore contributes formally codified design knowledge that will be useful to a class of problems, applicable to any organizations wishing to better understand how to improve customer service based on S-D logic's perspective of value creation.

Often, when designing an artifact using DSR, a contribution to its theoretical foundations is possible (Hevner et al. 2004). We make such contributions. First, we introduce attachment theory to service design, which suggests people may sometimes be reluctant to give constructive feedback about services due to the relationship they have with human actors who provide the front-line encounters. We show how utilizing cartoon rich pictures somehow negates this barrier and encourages narratives that are rich and candid. Second, only recently has the use of the systems theory of disability strengthened a DSR project (Tuunanen and Peffers 2018). The inclusion of this theory in the design of the TTT, and the subsequent use of inclusive design principles, negates exclusion from service design research on the basis of vulnerability or disability and adds to the applicability of the systems theory of disability for service design. The use of established service design methods when building the TTT enhances its validity (Domigall et al. 2013) and allows us to make contributions to them. We extend understanding of customer journeys, unveiling the need for researchers to extend their lenses in order to ensure the journey is as long as the customer perceives it to be. By demonstrating how to enable customers to select their own touchpoints and effectively map their own unique journey, we overcome some critical flaws of customer journey maps (Rosenbaum et al. 2017). Finally, we make a contribution to service design using DSR, which is still relatively novel in service research. Our contribution of both an artefact and a nascent design theory answers calls for such research to anchor this field (Teixeira et al. 2018).

Through a detailed DSR project spanning 4 years and incorporating 9 different organizations and 240 service users, we contribute a field-tested service design methodology that solves real problems and extends organizational capabilities (Hevner et al. 2004). We have demonstrated its use in palliative care services (core service provision is care, not cure), a more mainstream health setting (focusing on cure), and a veterinary service. All three services have different value propositions and different organizational-level service systems. We can conceive of no viable reason why a wide range of service organizations where customer experience is paramount cannot use the TTT. Theoretically, the TTT has potential to enhance understanding of value creation in luxury holidays, concerts, festivals, theme parks, or events, and we have provided the detailed prescription in order for other researchers to test this proposition.

We have shown how the TTT systematically collects service user's unique phenomenological perceptions of value at multiple levels of service, resulting in demonstrable innovations at each level of the service hierarchy. The TTT has proven ability to uncover opportunities for innovation that other mainstream methods failed to spotlight. We have also demonstrated how the TTT overcomes many limitations of alternative

service design methods; it is not cumbersome, time consuming or particularly expensive, nor does it entail physical interactions with service designers or require bespoke software. Yet, drawing on the socio-material approach to service design (Kimbell and Blomberg 2017), the TTT is able to acknowledge the messy realities shaping service experiences and how these experiences can be harnessed and transferred to useful and practical service innovations within and across levels of the service hierarchy. We have demonstrated empirically how the TTT is a much called-for enabling methodology that bridges the gap between the theoretical focus on value cocreation and resource integration that S-D logic provides, and the practical technique needed for implementation (Frow et al. 2015; Fuentes and Smyth 2016). We encourage use of the TTT in any organization wishing to incorporate the principles of S-D logic and value cocreation into service design, but is currently struggling with the practicalities of doing so.

REFERENCES

Alinsky, Saul D. (1971), Rules for Radicals. New York: Vintage Books.

Anderson, Sidney, Linda Nasr, and Steven W. Rayburn (2018), "Transformative Service Research and Service Design: Synergistic Effects in Healthcare," The Service Industries Journal, 38(1-2), 99-113.

Baskerville, Richard and Jan Pries-Heje (2010), "Explanatory Design Theory," Business & Information Systems Engineering, 2(5), 271-282.

Bate, Paul and Glenn Robert (2007), Bringing User Experience to Healthcare Improvement. Oxford: Radcliffe.

Bell Simon, Tessa Berg, Stephen Morse (2016), Rich Pictures: Encouraging Resilient Communities. New York: Routledge.

Bitner, Mary Jo (1992), "Servicescapes: The Impact of Physical Surroundings on Customers and Employees," Journal of Marketing, 56(2), 57-71.

------, Amy L. Ostrom and Felicia N. Morgan (2008), "Service Blueprinting. A Practical Technique for Service Innovation," California Management Review, 50(3), 66-94.

Bowlby, John (1969) Attachment and Loss, vol. 1. Attachment. New York: Basic Books.

Chandler, Jennifer D. and Stephen L. Vargo (2011), "Contextualization and Value-in-context: How Context Frames Exchange," Marketing Theory, 11(1), 35–49.

Chesbrough, Henry and Jim Spohrer (2006), "A Research Manifesto For Services Science," Communications of the ACM, 49(7), 35-40.

Churchman, Richard, Grady S. York, Beth Woodard, Charles Wainright and Mary Rau-Foster (2014), "Revisiting Perceptions of Quality of Hospice Care," American Journal of Hospice and Palliative Medicine, 31(5), 521–526.

Clarkson, P. John and Richard Coleman (2015), "History of Inclusive Design in the UK," Applied Ergonomics, 46(B), 235-247.

Clatworthy, Simon (2011), "Service Innovation through Touch-points: Development of an Innovation Toolkit for the First Stages of New Service Development," International Journal of Design, 5(2), 15-28.

Coggin Gerald (2008), "Critique of Ability," Innovation and Disability 11(3).

Coghlan, Peter and Iyla Prokopoff (2004), "Managing Change, by Design," in Managing as Designing, Boland, R. and F. Collopy, eds. Stanford, CA: Stanford University Press.

Domigall, Yannic, Antonia Albani, and Robert Winter (2013), "Towards an Innovative Service Development Process in the Electricity Industry," in Design Science at the Intersection of Physical and Virtual Design, Jan vom Brocke, Riitta Hekkala, Sudha Ram, and Matti Rossi, eds. Berlin Heidelberg: Springer-Verlag, 278–292.

Dresch, Aline, Daniel Lacerda and José Antunes (2015), Design Science Research: A Method for Science and Technology Advancement. Switzerland: Springer.

Dy Sydney Morss, Herr Keela, Rachelle E Bernacki, Arif Kamal, A. M. Walling, Mary Ersek, Sally A. Norton (2016), "Methodological Research Priorities in Palliative Care and Hospice Quality Measurement," Journal of Pain and Symptom Management, 51(2),155-162.

Edvardsson, Bo, Anders Gustafsson, Per Kristensson, and Lars Witell (2010), "Service Innovation and Customer Co development," in Handbook of Service Science, Paul P. Maglio, Cheryl A. Kieliszewski, and James C. Spohrer, eds. New York: Springer, 561-577.

Foglieni, Francesca, Beatrice Villari and Stefano Maffei (2018), Designing Better Services: A Strategic Approach from Design to Evaluation. Milan: Springer.

Frow, Pennie, Suvi Nenonen, Adrian Payne and Kaj Storbacka (2015), "Managing Co-creation Design: A Strategic Approach to Innovation," British Journal of Management, 26(3), 463–483.

Fuentes, Marcos and Hedley Smyth (2016), "Value Co-creation in a Project Setting: A Service-Dominant Logic Perspective," in Proceedings of the 32nd Annual ARCOM Conference, Vol. 2, P. W. Chan and C. J. Neilson, eds. Manchester, UK: Association of Researchers in Construction Management, 1059-1068.

Giovanni, Lisa (2012), "End-of-life care in the United States," Nursing Economics, 30(3), 127-135.

Glushko, Robert J. (2013) "Describing Service Systems," Human Factors in Ergonomics & Manufacturing, 23(1), 11-18.

Gregor, Shirley (2006), "The Nature of Theory in Information Systems," MIS Quarterly, 30(3), 611-642.

----- and Alan R. Hevner (2013), "Positioning and Presenting Design Science Research for Maximum Impact," MIS Quarterly, 37(2), 337-355.

-----, and David Jones (2007), "The Anatomy of a Design Theory," Journal of the Association of Information Systems, 8(5), 312-335.

Hagensen, Ann, Amy E. London, Jennifer J. Phillips, W. Scott Helton, Vincent J. Picozzi and C. Craig Blackmore (2016), "Using Experience-Based Design to Improve the Care Experience for Patients with Pancreatic Cancer," American Society of Clinical Oncology, 12(12), e1035-41.

Henderson-Sellers, Brian, Jolita Ralyté, Pär J. Ågerfalk, and Matti Rossi (2014), Situational Method Engineering. New York: Springer Heidelberg.

Hevner, Alan, Salvatore March, Jinsoo Park and Sudha Ram (2004), "Design Science in Information Systems Research," MIS Quarterly, 28(1), 75-105.

Holmlid, Stefan (2009), "Participative, Co-operative, Emancipatory: From Participatory Design to Service Design," First Nordic Conference on Service Design and Service Innovation, Oslo.

Jüttner, Uta, Dorothea Schaffner, Katharina Windler, Stan Maklan (2013), "Customer Service Experiences," European Journal of Marketing, 47(5/6), 738-769.

Key, Wesley and Culliney, Martin (2018), "The Oldest Old and the Risk of Social Exclusion," Social Policy and Society, 17(1), 47-63.

Kimbell, Lucy (2011), "Rethinking Design Thinking," Design and Culture, 3(3), 285-306.

---- and Jeanette Blomberg (2017), "The Object of Service Design," in Designing for Service: Key Issues and New Directions, Daniela Sangiorgi and Alison Prendiville, eds. London: Bloomsbury, 81-94.

Kuechler, William and Vijay Vaishnavi (2012), "A Framework for Theory Development in Design Science Research," Journal of the Association of Information Systems, 13(6), 395-423.

Lemon, Katherine N. and Peter C. Verhoef (2016), "Understanding Customer Experience Throughout the Customer Journey," Journal of Marketing, 80, 69–96.

Liberati, Elisa, Mara Gorli, Lorenzo Moja, Laura Galuppo and Silvio Ripamonti (2015), "Exploring the Practice of Patient Centered Care: The Role of Ethnography and Reflexivity," Social Science & Medicine, 133, 45-52.

Locock, Louise, Glenn Robert, Annette Boaz, Sonia Vougioukalou, Caroline Shuldham, Jonathan Fielden, Sue Ziebland, Melanie Gager, Ruth Tollyfield and John Pearcey (2014), "Using a National Archive of Patient Experience Narratives to Promote Local Patient-Centred Quality Improvement" Journal of Health Services Research & Policy, 19(4), 200-207.

Lusch, Robert F. and Satish Nambisan (2015), "Service Innovation: A Service-Dominant Logic Perspective," MIS Quarterly, 39(1), 155-175.

Maglio, Paul P. and Spohrer, Jim (2008), "Fundamentals of Service Science," Journal of the Academy of Marketing Science, 36:18–20.

Meroni, Anna and Daniella Sangiorgi (2011), Design for Services. Surrey, UK: Gower.

Michailakis, Dimitris (2003), "The Systems Theory Concept of Disability: One is Not Born a Disabled Person, One is Observed to Be One," Disability & Society, 18(2): 209-229.

Moriarty, Alanna (2017), “Will HCAHPS Stars Light the Way to Healthcare Transparency?” https://blog.definitivehc.com/top-hcahps-5-star-hospitals-daily-census

Ngo, Liem Viet and Aron O'Cass (2013), "Innovation and Business Success: The Mediating Role of Customer Participation," Journal of Business Research, 66(8), 1134-1142.

Overkamp, Tim, Johan Blomkvist, Vanessa Rodrigues, Mattias Arvola, and Stefan Holmlid (2018), “Resource Integration as a Perspective on Value in Interaction Design,” Proceedings of British HCI 2018. Belfast, UK.

Parker, Sophia and Joe Heapy (2016), The Journey to the Interface, London: Demos.

Patrício, Lia, Nelson Figueiredo de Pinho, Jorge Grenha Teixeira and Raymond P. Fisk (2018), “Service Design for Value Networks: Enabling Value Cocreation Interactions in Healthcare,” Service Science, 10(1), 76-97.

------, Raymond P. Fisk, João Falcãoe e Cunha and Larry Constantine (2011), “Multilevel Service Design: From Customer Value Constellation to Service Experience Blueprinting,” Journal of Service Research, 14(2), 180-200.

-----, Anders Gustafsson, and Raymond Fisk (2017), “Upframing Service Design and Innovation for Research Impact,” Journal of Service Research, 21(1), 3-16.

------, Raymond Fisk and João Falcão e Cunha (2008), “Designing Multi-Interface Service Experiences,” Journal of Service Research, 10(4), 318-334.

Payne, Adrian F., Kaj Storbacka, and Pennie Frow (2008), “Managing the Co-Creation of Value,” Journal of the Academy of Marketing Science, 36: 83–96.

Peffers, Ken, Marcus Rothenberger, Tuure Tuunanen, and Reza Vaezi (2012), “Design Science Research Evaluation,” in in Design Science Research and Information Systems, K. Peffers, M. Rothenberger and B. Kuechler eds. Berlin: Springer-Verlag, 398-410.

------, Tuure Tuunanen, Marcus A. Rothenberger and Samir Chatterjee (2007), “A Design Science Research Methodology for Information Systems Research,” Journal of Management Information Systems, 24(3), 45–77.

------, ------ and Björn Niehaves (2018), “Design Science Research Genres,” European Journal of Information Systems, 27(2), 129-139.

Rosenbaum, Mark S., Mauricio Losada Otalora and Germán Contreras Ramírez (2017), “How to Create a Realistic Customer Journey Map,” Business Horizons, 60, 143-150.

Sein, Maung K., Ola Henfridsson, Sandeep Purao, Matti Rossi, and Rikard Lindgren (2011), “Action Design Research,” MIS Quarterly, 35(1), 37-56.

Service Design Toolkit (2012) http://sdt.fi/materiaali/ServiceDesignToolkit_english.pdf

Service Design Tools (2019) http://www.servicedesigntools.org/

Shostack, G. Lynn (1982), "How to Design a Service," European Journal of Marketing, 16(1), 49-63.

Skålén, Per, Johanna Gummerus, Catharina von Koskull, and Peter R. Magnusson (2015), "Exploring Value Propositions and Service Innovation: A Service-Dominant Logic Study," Journal of the Academy of Marketing Science, 43(2), 137–158.

Stephens, Nancy and Kevin P. Gwinner (1998), "Why Don't Some People Complain?" Journal of the Academy of Marketing Science, 26(3), 172-189.

Storey, Chris and Christine Larbig (2018), "Absorbing Customer Knowledge: How Customer Involvement Enables Service Design Success," Journal of Service Research, 21(1), 101-118.

Teixeira, Jorge Grenha, Lia Patrício and Tuure Tuunanen (2018), "Bringing Design Science Research to Service Design," in Exploring Service Science, Gerhard Satzger, Lia Patrício, Mohamed Zaki, Niklas Kühl and Peter Hottum, eds. Switzerland: Springer, 373-384.

------, ------, Ko-Hsun Huang, Raymond P. Fisk, Leonel Nóbrega and Larry Constantine (2017), "The MINDS Method: Integrating Management and Interaction Design Perspectives for Service Design," Journal of Service Research, 20(3), 240-258.

-----, Lia Patrício, Leonel Nóbrega, Larry Constantine, and Raymond P. Fisk (2012), "Designing Services with Model-Based Methods," 19th International Product Development Management Conference, Manchester, UK.

Tuunanen, Tuure and and Ken Peffers (2018), "Population Targeted Requirements Acquisition", European Journal of Information Systems, 27(6), 686-711.

United Nations (2019), World Population Prospects 2019 https://www.un.org/en/sections/issues-depth/ageing/

Van Aken, Joan E. (2004), "Management Research Based on the Paradigm of the Design Sciences," Journal of Management Studies, 41(2), 219-246.

Vargo, Stephen L. and Melissa Archpru Akaka (2009), "Service-Dominant Logic as a Foundation for Service Science," Service Science, 1(1), 32-41.

---- and Robert F. Lusch (2004), "Evolving to a New Dominant Logic for Marketing," Journal of Marketing, 68, 1–17.

----- and ----- (2008), "Service-Dominant Logic: Continuing the Evolution," Journal of the Academy of Marketing Science, 36(1), 1–10.

----- and ----- (2016), "Institutions and Axioms: An Extension and Update of Service-Dominant Logic," Journal of the Academy of Marketing Science, 44, 5–23.

----- and ----- (2017), "Service-Dominant Logic 2025," International Journal of Research in Marketing, 34, 46-67.

Venable, John, Jan Pries-Heje and Richard Baskerville (2016), "FEDS: a Framework for Evaluation in Design Science Research," European Journal of Information Systems, 25(1), 77-89.

Vink, Josina, Kataria Wetter-Edman, and Manuela Aguirre (2017), "Designing for Aesthetic Disruption: Altering Mental Models in Social Systems through Designerly Practices," The Design Journal, 20(Sup1), S2168-S2177.

Waytz, Adam, Carey Morewedge, Nicholas Epley, George Monteleone, Jia-Hong Gao, and John T. Cacioppo (2010), "Making Sense by Making Sentient," Journal of Personality and Social Psychology, 99(3), 410–435.

West, Brady T. and Annelies G. Blom (2017), "Explaining Interviewer Effects: A Research Synthesis," Journal of Survey Statistics and Methodology, 5(2), 175–211.

Wetter-Edman, Katarina , Daniela Sangiorgi, Bo Edvardsson, Stefan Holmlid, Christian Grönroos, and Tuuli Mattelmäki (2014), "Design for Value Co-Creation: Exploring Synergies Between Design for Service and Service Logic," Service Science, 6(2):106-121.

-----, Josina Vink, and Johan Blomkvist (2017), "Staging Aesthetic Disruption through Design Methods for Service Innovation," Design Studies, 55, 5-26.

Witell, Lars, Hannah Snyder, Anders Gustafsson, Paul Fombelle, and Per Kristensson (2016), "Defining Service Innovation: A Review and Synthesis," Journal of Business Research, 69(8), 2863-2872.

Woodside, Arch G., Suresh Sood, and Kenneth E. Miller (2008), "When Consumers and Brands Talk: Storytelling Theory and Research in Psychology and Marketing," Psychology & Marketing, 25(2), 97–145.

World Health Organization (2018), World Health Statistics.
https://www.who.int/gho/publications/world_health_statistics/en/

Zomerdijk, Leonieke G. and Christopher A. Voss (2010), "Service Design for Experience-Centric Service," Journal of Service Research, 13(1), 67–82.

Table 1: Method parts chosen from the method base to inform the design of the TTT

Service Design Method & conceptualization	**Objective 1. Be easy to use for both researcher/service provider, & all service users**	**Objective 2. Systematically capture the tactic knowledge embedded in lived experiences of service users.**	**Objective 3. Enhance understanding of value creation from customer's perspective: value emerges in context within interconnections of tangible and intangible resources.**	**Objective 4. Uncover viable opportunities for innovation via opportunities to reconfigure resources within & between service systems different levels of the service hierarchy.**
Touchpoints Clatworthy 2011; Zomerdijk and Voss 2010) Points of contact, or interactions, between a service provider and a customer; a central concept in service design	(+) Easy to understand concept. (+) Helps customers to articulate connections with myriad touchpoints, going beyond interactions with core service provider.	(-) Literature acknowledges importance of touchpoints, but provides little guidance how to design, orchestrate, and coordinate them. (-) Touchpoints must be those interactions that are important to the customer; these may differ from those intuitive to the service provider.	(+) Touchpoints can be physical, sensorial, symbolic & social, & include customer expectations, barriers, motivators, feelings, & emotions (-) Touchpoint identification alone does not provide insight into value cocreation	(-) Individual touchpoints risk partitioning the service – touchpoints alone provide little insight into processual service elements. (-) Lack of best practice exemplars on how to integrate and coordinate individual touchpoints. (-) Identification of touchpoints does not provide managers with guidance on how to use touchpoints for innovation. (-) Do not provide a view of the overall service system.
Servicescapes (Bitner 1992; Parker and Heapy 2006) The physical environment in which a service is experienced.	(-) No unified servicescape determinants for all service organizations.	(-) Concept does not aid knowledge capture	(+) Servicescape design can have a profound impact on customer experience. (+) Incorporates the major dimensions of ambience, physical design, & social (-) No consensus as to the situations in which the servicescape becomes critical to customer experiences.	(-) Literature provides little guidance as to the role of the servicescape in service design. (-) Servicescapes do not capture the holistic service.

Service Blueprinting (Shostack 1982; Bitner et al. 2008; Patrício et al. 2008) Mapping technique to visualize entire service system.	(-) Complex & cumbersome when attempting to map a multifaceted service offering.	(-) Inordinate amount of information required to map each service dimension. (-) Tells us little (if anything) about the perceptions of service users.	(+) Forces us to consider tangible and intangible aspects of the entire service system. (-) Unable to cope with the complexity of multiple service offerings (-) Takes a dyadic view of the service encounter where the customer has a passive role.	(+) Ensures service designers break down a service into logical components and processes. (+) Depicts a service offering from a multidimensional perspective (customer actions, onstage & backstage employee actions, support processes, physical evidence)
Customer Journey Mapping (Rosenbaum et al. 2017; Zomerdijk and Voss 2010) A linear depiction of the customer service experience.	(+) Can map the service from the customer's perspective. (-) Simple visualizations of the basic linear service process omit nuanced yet crucially important touchpoints; the more complex methods can be too cumbersome to be of practical value.	(-) Usually, internal actors design the maps, risking omitting touchpoints important to the customer	(-) Assumes all customers experience the same touchpoints. (-) Assumes all touchpoints are of equal importance. (+) Incorporates consideration of the process as well as the various encounters.	(+) Goes beyond the core service offering to incorporate pre-and post-consumption stages (+) Acknowledges both processual and experiential aspects of service. (+) Helps understanding of customer experience across various service levels. (-) Does not provide a view of the overall service system.
EBCD (Bate & Robert 2007; Locock et al. 2014) Uses interviews, observations, and group discussions to identify emotionally significant key service elements (i.e., touchpoints).	(-) Staff resource intensive. (-) Time consuming: a typical EBCD study takes 12 months. (-) This is an expensive method, typically costing in region of $40,000 for investigating one element of a single service.	(+) Focus on storytelling allows for rich insights into service user experiences.	(+) Brings users and providers together to explore cocreation opportunities. (+) Including staff in search for innovation solutions ensures staff on-board to innovation process.	(-) Concentrates on specific service dimensions, but is unable to take a holistic perspective to examine the whole customer experience. (-) Because EBCD concentrates on precise service dimensions, evidence suggests the method leads to small scale changes rather than systematic innovations at different service levels.

Rich Pictures (Bell, Berg and Morse, 2016) A method for exploring a situation through diagrams, pictures, or mental models.	(+) Images enhance attention and recall. (+) People process images more quickly than words. (+) Can be used with people unable to read & write	(+) Intuition and sub-consciousness connect to impressions and symbols better than words, so can capture and elucidate potential influences that may otherwise have remained hidden. (+)Enhances and enriches the data collected, compared to usual in-depth interviews. (+) Increases the amount of useful data generated.	(-) Paucity of service research studies using rich pictures in this way meant we lacked evidence that they would be effective in this context.	(+) Appropriate for complex research situations where multiple forces and interactions between forces are present.

Figure 1. Six-Step DSR Process

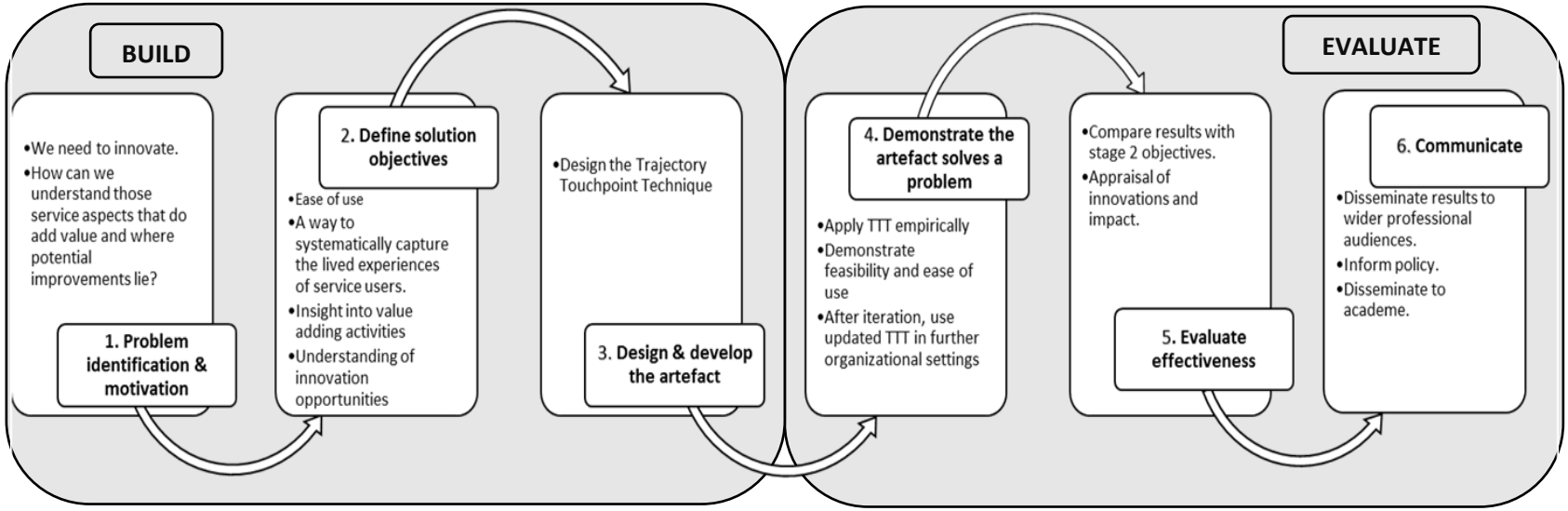

Figure 2: Early versus finalized design of touchpoint cards

Early version with cartoon and non-cartoon images. **Finalized cartoon version.**

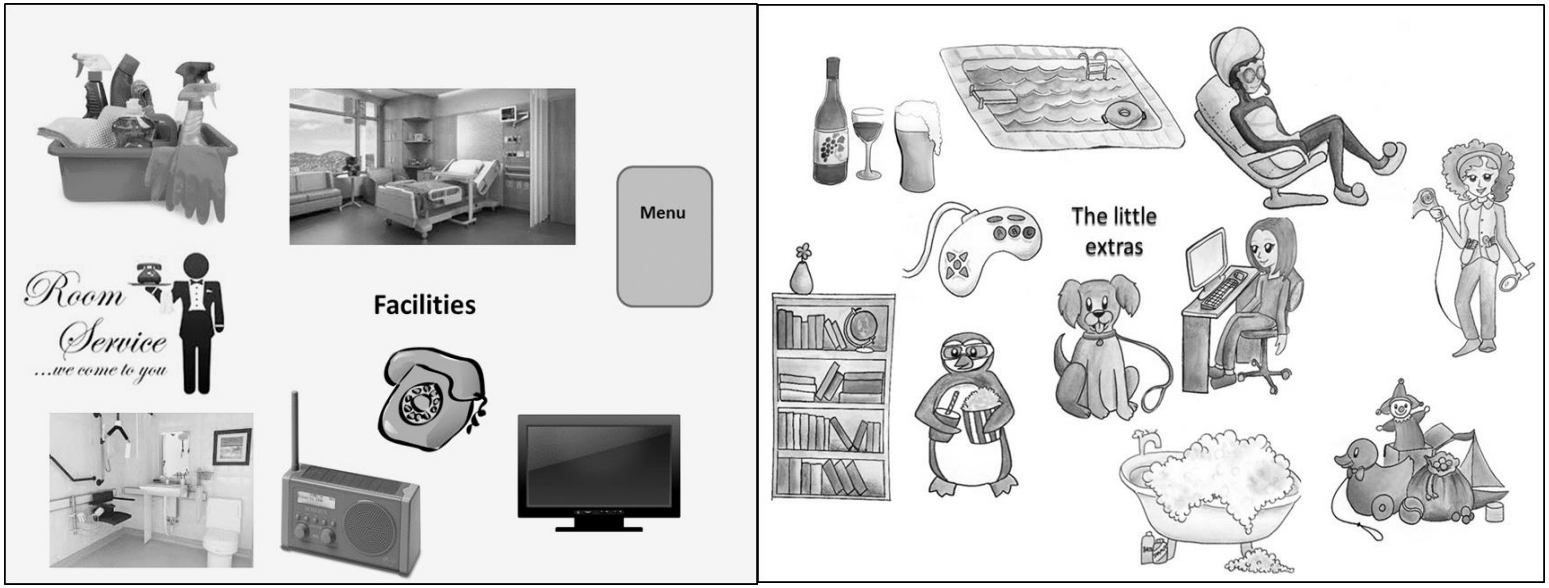

Figure 3: TTT Design Method

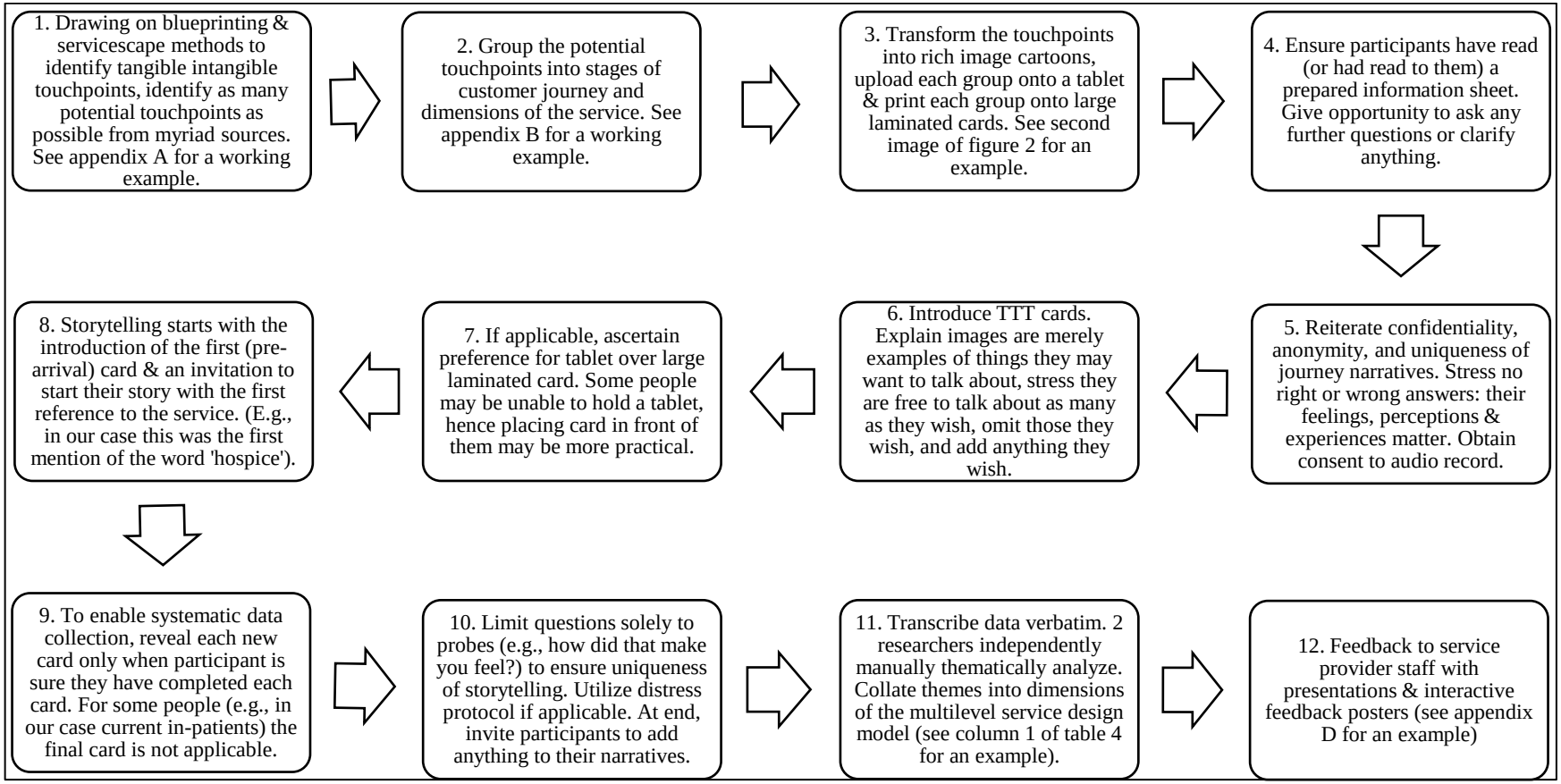

Figure 4: Research Inputs and Outputs

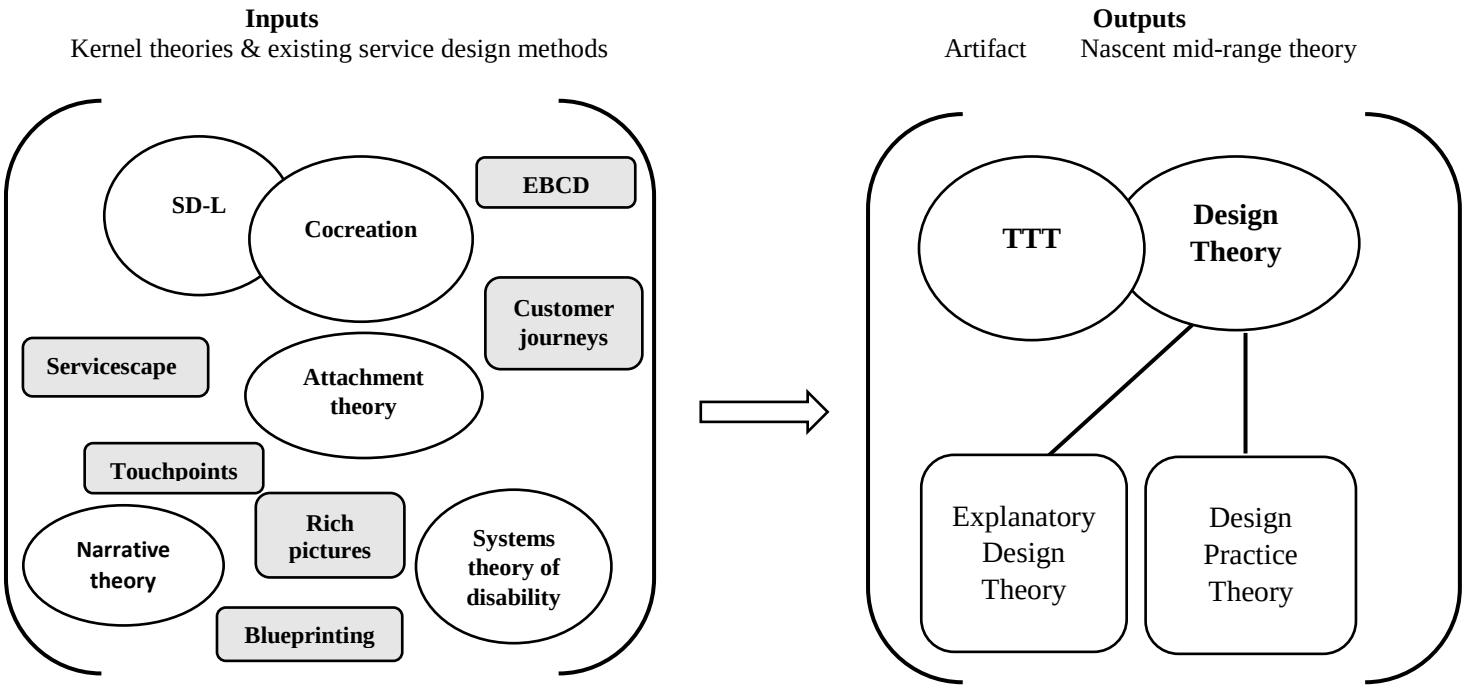

Table 2: Design Theory

	Explanatory Design Theory
General Requirements	Service innovation must consider value cocreation from the customer's perspective. Understanding value cocreation comes from the customer's lived experiences. These experiences are unique hence service users must select touchpoints that resonate in order to map their own unique journey. Because the beneficiary uniquely and phenomenologically determines value, organizations need to capture customer's insights into value in a systematic and inclusive manner. Value needs to be understood holistically, considering interdependencies between service systems as well as within and between levels of the service hierarchy. Service innovation entails understanding how to create and reconfigure resources to transform service systems. Organizations need to know how to practically design services in order to integrate resources for enhanced value cocreation opportunities.
General [solution] Components	Experiential focus. Thick description. Systematic data capture process. Give control. Use inclusive design principles. Holistic and multi-dimensional perspective. Systematic value-focused thematic analysis Accessible knowledge transfer process.
	Design Practice Theory
Justificatory Knowledge	Existing service design methods: Touchpoints, Servicescapes, Service Blueprinting, Customer Journey Maps, EBCD, Rich Pictures. Refer to table 1 for detailed explanation Kernel theories: S-D Logic and Cocreation, Attachment Theory, Narrative Theory, Systems Theory of Disability. See stage 3 for detailed explanation.
Design Method	DSR process: Refer to figure 1 for general process. Detailed 12-step TTT design method: Refer to figure 3
Testable Propositions	1. Due to its inclusive design principles, the TTT is easy to use with the majority of customers. 2. The design of the TTT will aid systematic capture of tactic knowledge embedded in lived experiences of service users. 3. The TTT enhances the organization's understanding of value from the customer's perspective. 4. Because the TTT's design encourages service users to narrate their own unique experiences, it will reveal viable and practical innovation opportunities hitherto unconsidered. 5. The TTT is adaptable for use with a range of services

Table 3: Collaborating Organizations (n = 9) and Participant Profile (n=240)

Participating Organizations					Service User Profile				
Case	**Alias**	**Area**	**Funding**	**Services**	**In-patients**	**Day & outpatients**	**Relative & caregivers**	**Bereaved family**	**Total**
1	Red Hospice	Towns N England	20% Govt. 80% charity	Inpatient Unit; Outpatient center	4	14	12	8	38
1	Yellow Hospice	City NW England	40% Govt. 60% charity	Inpatient Unit; Day center services	10	6	7	5	28
1	Blue Hospice	Towns SE England	11% Govt. 89% charity	Inpatient Unit; Day hospice; Hospice@home	4	14	4	9	31
1	Green Hospice	City NW England	47% Govt. 53% charity	Inpatient Unit; Day therapy unit; Hospice@home	6	4	6	5	21
1	Purple Hospice	City NE England	10% Govt. 90% charity	Children's Hospice with Inpatient Unit, Respite Services; End-of-Life Bereavement Suites	1	1	13	7	22
1	Palliative Care Unit	City NW England	Govt. funded hospital & research grants	Specialist hospital inpatient unit for most complex end-of-life needs	9	N/A	16	4	29
1	Palliative Care Services	City NW England	Team in Govt. funded hospital	Multidisciplinary Specialist Palliative Care Team delivering a range of support & pain management	N/A	4	11	5	20
				Sub Totals (for case study evaluation)	**34**	**43**	**69**	**43**	**189**
2	Medical/ Surgical Unit	NY	Private Hospital	Inpatient unit delivers care for patients with a multiplicity of medical & post-surgical needs	25	N/A	N/A	N/A	25
3	Veterinary Practice	Town NE England	Not-for-profit veterinary company	Range of veterinary services including Orthopedic Surgery, CT Scans, ER (24/7), Inpatient Care, Hydrotherapy & Rehabilitation	6	14	N/A	N/A	26
				Total	**65**	**57**	**69**	**43**	**240**

Figure 5: Evaluation Strategy

Stages	Stage 1 Explicate evaluation goals	Stage 2 Choose evaluation strategy	Stage 3 Determine evaluation properties	Stage 4 Design evaluation episodes
Key considerations	**Rigor** *formative v summative* *artificial v naturalistic* **Uncertainty & risk reduction** *user or technically oriented* **Ethics** *consider safety and dignity of participants* **Efficiency** *resources (time and money) available*	**Quick & Simple** *suitable for small/simple designs with low social/technical risk* **Human Risk & Effectiveness** *risk is user oriented & critical goal is rigorous establishment of artifact utility in real situations* **Technical Risk & Efficacy** *when risk is technically oriented but evaluation with real users is prohibitively expensive* **Purely Technical Artefact** *No social aspects to consider*	**Determine evaluands** *Consider evaluation goals (step 1) & chosen strategy (step 2). Distinguish product artifacts from process artifacts.* **Determine generic evaluation properties** – *nature of artifact will impact e.g., ISO standards may be applicable for technical artifacts, other evaluation criteria such as effectiveness, efficiency, perceived usefulness, impact.*	**Determine number and nature of actual evaluation episodes**, *considering decision made from analyses within previous stages* *Consider resource constraints* *Prioritize contextual factors.*
TTT evaluation strategy	⇩ Goal is to **rigorously establish utility of TTT** via: **Formative evaluation** *in early stages of demonstration: risk with cartoon images* **Summative evaluation** *to judge outcomes against objectives: ease of use under distressing circumstances* **Naturalistic evaluation** *across different hospices and palliative care organizations – greater resources required but required for high levels of rigor*	⇩ **Human Risk & Effectiveness Strategy:** *Focus on rigorous evaluation of the effectiveness of the TTT across hospices and other palliative care providers.* *Demonstration of the TTT's ability to be easily adapted to services other than palliative care.* *Design risk is user oriented.*	⇩ **Product artifacts** *The touchpoint visuals cards* **Process artifacts** *The TTT as a methodology* **Evaluation properties** *Utility against original goals:* 1. *Ease of use* 2. *Systematically capture lived experiences* 3. *Insight into value creation* 4. *Understanding opportunities for innovation*	⇩ **Formative naturalistic evaluation** (*human risk and effectiveness strategy) against objective 1* **Summative naturalistic evaluation** *(human risk and effectiveness strategy), using* ***in-depth case*** *study comprising the multiple palliative care providers. Specifically: Evaluate product and process artifacts against objectives 1-3* *Evaluate process artifact against objective 4.*

Table 4: Examples of innovations at each level of service

Examples of themes	Resulting Innovations
Value Constellation: A system of systems – the network of service offerings by different service providers	
Need for more counselling for caregivers *"…I would just like a counsellor...I just don't know what I should be like, my husband is dying… But do other people feel like that, or is it just me?..... I just want someone to say oh yeah you do feel like that, or no you are mad, you can't wait to get rid of him, you know. Just…. to see if I am normal" (Caregiver);* *"Oh I do need to talk but luckily I have a very good friend" (Caregiver).*	**'Graduate Groups' and other user-led support groups now launched** – Hospice staff facilitated the inauguration of these groups which now comprise solely of service users supporting each other.
Hearing about Hospice services was often late & serendipitous *"we were at the hospital and I spotted a leaflet – I don't know why the GP had not mentioned it – we needed it a lot earlier… because we have struggled" (Caregiver);* *"even our doctor was not clear that hospices were for people with non-cancer diagnoses as well" (Caregiver);* *"He was really struggling and he didn't know about the hospice… he looked to his district nurses and they had not really done their job and made the connection" (Caregiver).*	**Major changes to ecosystem networks** include the launch of training programs delivered by the hospices with local family doctors on a (regular) bi-annual cycle, & monthly lunchtime training forum for relevant professionals (e.g., care home managers). These training and networking sessions are building relationships and dialogue and constantly uncovering ways to improve integration among the various actors.
Many want to die at home, but families are unable to cope *"We started to look at places for residential care in the vicinity, but we also had to convince him to leave his home…. it all took a bit of work to convince him that he should go into care and leave his lovely home" (Caregiver); "He had said that he wanted to die at home but…" (Caregiver); "The situation at home was disintegrating" (Bereaved);"There's no doubt about it, being at home is by far and away the best option, in my view" (Caregiver).*	**Red Hospice launches new Hospice@Home service** This innovation came about as a direct result of better understanding the true value of its service provision, and indeed the crisis levels some families experienced before they received the service.
Service System: The organization's configuration of resources. Incorporates people, processes (front & back stage) & environment	
Continuity of care problems *"Towards the end of his life it would have been nice if they weren't bank [locum] staff, not that they weren't good but they didn't know him or him them" (Bereaved).*	**Changes to employment contracts and rosters** Doctors now work more sessions in order to provide greater levels of continuity.
Unable to concentrate due to illness or medication (e.g., chemotherapy) *"she loves reading but she can't as she can't concentrate anymore" (Caregiver);* *"I really miss a good book but I can't sit up long enough to read now" (Patient)*	**Audio books and newspapers** are now available for those patients too tired to read

Servicescape issues for hospital-based outpatients; from clinic waiting rooms to the environment in which bad news is delivered: "*The waiting room…it was a bit yucky." "Sometimes we were looking for a bit more privacy than there was in that particular waiting room." "We were put in a room which didn't have any windows, and it had a light which come on when you moved." "...off the corridor.. a little cell…very brown"* **(***Patients***)**	**A new quiet room now** allocated for patients and their families for use before or after appointments. This room was designed with dignity and confidentiality in mind.
Shared spaces matter: and not everyone feels the same way *"she was not a particularly social person…a shared ward was a problem*" **(***bereaved***);** while for others the contrast was striking: *"the first couple of nights I was a bit lonely… I'd have preferred some company" (Patient)*	**Admission protocols altered** and now include questions on shared versus private ward preferences
Service Encounter: The Touchpoints	
Existing Communications fails to bust misconceptions "*Yeah I looked at the website…we were given some leaflets as well… I binned them" (Parent); "it's quite different seeing something on a website to how it actually is, how somewhere feels" (Bereaved)*	**'Meet and Eat' Program launched** where public & prospective users are invited into the hospice to learn more about the services offered**.**
Feelings of isolation for some inpatients *"Um, if I am totally honest, I did feel quite isolated at times because you are on your own for quite a long time in the day, between people popping in to see you officially, you know? I know it is very busy and the team work really hard but it just seems like long days and sometimes it was very, um, it would have been nice to have someone to talk to"*	**New roles for volunteers** now there is always a volunteer on the ward ready and willing to talk to a patient, even during the night which emerged as a particularly frightening time for some patients.
Issues around personal appearance Particularly pertinent for female cancer patients: *"she would say "oh look at the state of my hair!" (Bereaved).*	**Mobile hairdressers** now visit several hospices each week.
Clinical encounter: issues around dying From insufficient information: *"looking back I think… they were trying to tell me something" (Bereaved)* **;** To being too forthright*: "the doctor was talking about the do not resuscitate form…I was taken aback, at that point nobody said that Jim was about to pass away" (Bereaved)*	**New clinical communication protocols initiated** With far more emphasis on disease trajectory and the importance of advanced care planning.